

ABSTRACT

The master's dissertation consists of an introduction, five chapters, a general conclusion, a list of references. The dissertation contains 85 pages of the main text, 32 illustrations, 41 tables and 25 references. Total volume of work - 69 pages.

Purpose and objectives of the work. The aim of the work is to evaluate the influence of the flow body shape and the hydraulic channel shape on the flow meter metrological characteristics. The investigated instrument is the basis of the automated water metering system.

Achieving this goal involves solving the following tasks:

- substantiation of data transmission technology for the creation of an automated water metering system;
- generalization and analysis of the current state of vortex water flow metering instruments;
- development of a mathematical model of pressure losses in the flow transducer;
- carrying out mathematical modeling of the flow meter operation for different configurations of the hydraulic channel;
- reproduction of the channel structure using CFD technologies;
- assessment of the flow transducer pressure loss.

The object of research is the process of determining the metrological characteristics of the flow meter.

The subject of the study is the vortex flowmeter of the automated water flow metering system.

Research methods: the methods underlying the work are based on the basic laws of hydrodynamics (Bernoulli, continuity equation) to estimate the pressure loss in the hydraulic channel of the flow meter; computational fluid dynamics (CFD) methods using Ansys Fluent software to validate the results.

Practical significance of the obtained results:

- a mathematical model of the flow meter pressure loss was created;

- the shape of the sensitive element, which provides the widest measuring range, is established;
- vortex flow meter body flow shape optimization was performed.

Approbation of dissertation results. The main provisions and results of the dissertation were reported and discussed at the scientific-practical conference "Efficiency of engineering solutions in instrument making" (Kyiv, 2021).

Publications. The results of the work are published in the materials of the 1 conference and 1 article in the professional publication.

Key words: automated water metering system, vortex flowmeter, body flow, optimization, pressure loss.